

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (previously presented): A color conversion relation derivation method of deriving a color conversion relation between a first color space and a second color space, the color conversion relation derivation method comprising:

an area forming step that forms a plurality of areas filling the first color space such that the plurality of areas are arranged in lattice configuration and partially overlay each other in the first color space;

a partial function derivation step that derives, for each of the areas formed in the area forming step, a coefficient of a partial function representative of a color conversion between coordinates in the area and coordinates of the second color space using a set of an arbitrary sample point provided in the first color space and a point in the second color space, which is associated with the sample point; and

a whole function derivation step that, in a range that the areas are overlapped with each other, combines the partial functions by obtaining a coefficient interpolated by the coefficient of the partial function for each of the overlapped areas and by deriving a function represented by the interpolated coefficient, and derives a whole function representative of the color conversion relation through the first color space in its entirety.

2. (canceled).

3. (previously presented): A color conversion relation derivation apparatus for deriving a color conversion relation between a first color space and a second color space, the color conversion relation derivation apparatus comprising:

an area forming section that forms a plurality of areas filling the first color space such that the plurality of areas are arranged in lattice configuration and partially overlay each other in the first color space;

a partial function derivation section that derives, for each of the areas formed in the area forming section, a coefficient of a partial function representative of a color conversion between coordinates in the area and coordinates of the second color space using a set of an arbitrary sample point provided in the first color space and a point in the second color space, which is associated with the sample point; and

a whole function derivation section that, in a range that the areas are overlapped with each other, combines the partial functions by obtaining a coefficient interpolated by the coefficient of the partial function for each of the overlapped areas and by deriving a function represented by the interpolated coefficient, and derives a whole function representative of the color conversion relation through the first color space in its entirety.

4. (previously presented): A color conversion relation derivation program storage medium storing a color conversion relation derivation program which causes a computer to operate as a color conversion relation derivation apparatus, when the color conversion relation derivation program is incorporated into the computer and is executed, the color conversion relation derivation apparatus comprising:

an area forming section that forms a plurality of areas filling the first color space such that the plurality of areas are arranged in lattice configuration and partially overlay each other in the first color space;

a partial function derivation section that derives, for each of the areas formed in the area forming section, a coefficient of a partial function representative of a color conversion between coordinates in the area and coordinates of the second color space using a set of an arbitrary sample point provided in the first color space and a point in the second color space, which is associated with the sample point; and

a whole function derivation section that, in a range that the areas are overlapped with each other, combines the partial functions by obtaining a coefficient interpolated by the coefficient of the partial function for each of the overlapped areas and by deriving a function represented by the interpolated coefficient, and derives a whole function representative of the color conversion relation through the first color space in its entirety.

5. (previously presented): The color conversion relation derivation method according to claim 1, wherein each area formed by the area forming step is of equal size.

6. (previously presented): The color conversion relation derivation method according to claim 1, wherein the area forming step separates the first color space into a plurality of sections, wherein the plurality of areas are formed in the plurality of sections.

7-11. (canceled).

12. (previously presented): The apparatus of claim 3, wherein the partial function derivation section comprises determining a weighted function of the set of arbitrary sample points to a point overlapping each of the plurality of areas.

13. (cancelled).

14. (previously presented): The color conversion relation derivation method according to claim 1, wherein the area defining step assigns a plurality of divisional points to a lattice, thereby forming the plurality of areas filling the first color space.

15. (previously presented): The apparatus of claim 3, wherein the area forming section assigns a plurality of divisional points to a lattice, thereby forming the plurality of areas filling the first color space.

16. (canceled).

17. (canceled).

18. (previously presented): The color conversion relation derivation method according to claim 1, wherein the partial function is a polynomial expression of the first color space.

19. (previously presented): The color conversion relation derivation method according to claim 18, wherein the whole functions is a smoothing function to join each polynomial expression with at least one other polynomial expression.

20. (canceled).

21. (canceled).

22. (previously presented): The color conversion relation derivation method according to claim 1, wherein the partial function derivation step is a step to derive the coefficient of the partial function in the area by a coefficient least square method in which the sample point in the first color space is weighted in accordance with a distance from a center of the area.

23. (previously presented): The color conversion relation derivation method according to claim 1, wherein the partial function derivation step is a step to derive the coefficient of the partial function by weighing accordance with a distance from a position representative of gray in the first color space.